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INCIDENCE RATES OF LYMPHOID LEUKEMIA IN CHILDREN OF ACTIVE-DUTY NAVY SERVICEMEMBERS

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INTRODUCTION

At the request of BUMED, the Naval Health Research Center (NHRC) ascertained incidence (first hospitalization) rates of lymphoid leukemia (ICD9 204.XX) in children of active-duty Navy personnel during 1 January 1997 through 31 December 2000.

OBJECTIVE

The objective of this effort was to calculate the incidence (first hospitalization) rate of acute lymphoid leukemia during the period from 1 January 1997 to 31 December 2000, in dependent children 0-24 years old of Navy servicemembers, using existing electronic data resources. Another objective was to provide a comparison with SEER incidence rates for the general population of the same ages.

METHODS

The parameters of the overall case definition used in the case search were developed in collaboration with the Nevada State Health Department State Epidemiologist, Dr. Randall Todd and CAPT Jeff Yund, MC, USN, of the Navy Bureau of Medicine and Surgery (MED-24). The case definition used in this report was any dependent child aged 0-24 years, first

hospitalized for lymphoid leukemia (ICD9 Code 204.XX) in a military medical treatment facility or a general hospital reimbursed by the Department of Defense (DoD) during the period from 1 January 1997 through 31 December 2000.

Data sources used for case identification.

Two large hospitalization data bases were searched for potential cases as part of a previous analysis of leukemia cases (1). The first of these was the Standard Inpatient Data Record (SIDR) inpatient database of admissions to DoD medical treatment facilities. This database, which is maintained by the Executive Information Service and Decision Support (EI/DS) for the Military Health Care System (MHS) at Fort Detrick, Maryland, was used to ascertain hospitalizations within DoD medical treatment facilities. The second was the Health Care Service Record (HCSR), available from the Department of Defense TriCare Management Authority (TMA), which was used to ascertain DoD-reimbursed hospitalizations of Navy family dependent children beneficiaries outside military medical treatment facilities. The search procedure that was used was extensive, but was limited to hospitalizations in military or civilian hospitals with links to

DoD. It did not include any hospitalizations not reimbursed by DoD, or any not yet reported in the SIDR and HCSR databases. Reporting of hospitalizations may sometimes require several months before the case appears in centralized databases. Therefore, data for cases that occurred during the last half of 2000 may be incomplete. Case finding required searching approximately 2 million H.C.S.R. and SIDR electronic hospitalization records for the period 1 January 1997 to 15 March 2001; an additional 10 million prior hospitalization records were searched to confirm that the cases hospitalized on or after 1 January 1997 had no previous hospitalization for leukemia. The search revealed 128 records

of first hospitalizations for lymphoid or myeloid leukemia in Navy or Marine Corps beneficiaries under age 25. Ninety cases were lymphoid leukemia (ICD9 code 204.XX) and 38 cases were myeloid leukemia (ICD9 code 205.XX). These included 56 cases identified throughout the world from the SIDR files and 72 from the HCSR files. The present analysis was based on 26 dependent children of active-duty Navy families first hospitalized for lymphoid leukemia between 1 January 1997 and 31 December 2001, a subset of the 94 cases identified in the search of HCSR and EI/DS records. Case selection criteria are shown in Figure 1.

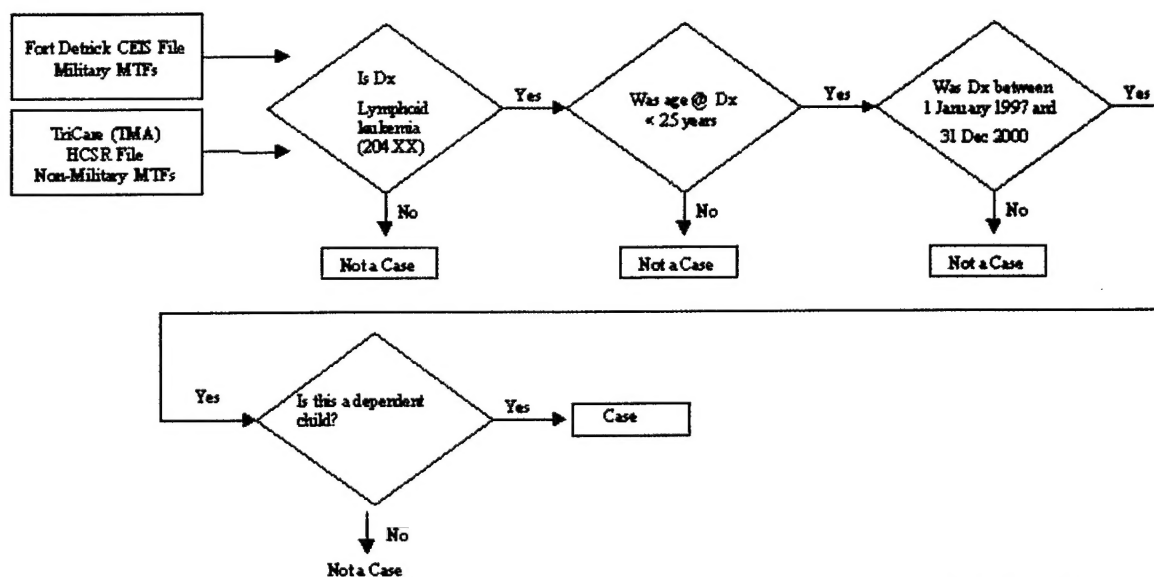


Figure 1. Case criteria and procedures used for ascertainment of lymphoid leukemia (ICD9 204.XX) during 1 JAN 1997 – 31 DEC 2000 among dependent children of Navy servicemembers

Data sources used for denominators. Denominator data were obtained from the Defense Manpower Data Center (DMDC) in Monterey, California. The DMDC provided Age-specific counts of dependent children in families of active-duty Navy servicemembers who were registered with the Defense Eligibility and Enrollment System (DEERS) on 31 December of each year from 1997 through 2000. Enrollment of dependents in DEERS is a requirement for reimbursement for medical care by the

DoD or for reimbursed treatment in DoD Medical Treatment Facilities.

Data source used for civilian population comparison. The latest published age- and sex-specific SEER rates that were available National Cancer Institute (NCI) for acute lymphoid leukemia from the were used for comparison (2). These rates were for a six-year period ending in 1994. Published rates for 1997-2000 have not yet been published by the NCI.

Statistical procedures. Age-specific first hospitalization rates were calculated for five-year age intervals for each gender. Standardized Incidence Ratios were calculated as the ratio of observed to expected rates based on SEER rates applied to the population distribution of children of

active-duty Navy families using the standard method (3). Confidence intervals of age-specific rates and SIRs were calculated using a standard method based on the Poisson distribution, which is appropriate for rare events (3).

Rate per 100,000 Person-years of First Hospitalizations for Lymphoid Leukemia (ICD9 Code 204.XX) in Children of Active-Duty Navy Servicemembers, by Age and Gender, 1997-2000.

MALES						
Age	Number of cases	No. of person-years	Navy rate	95% Confidence limits ⁽¹⁾		U.S. SEER rate ⁽²⁾
				Lower	Upper	
0-4	5	206,388	2.4	0.8	5.6	6.8
5-9	4	206,383	1.9	0.5	5.0	3.2
10-14	0	162,193	0.0	0.0	1.8	2.0
15-19	4	89,004	4.5	1.2	11.5	1.4
20-24	3	25,840	11.6	2.4	33.9	1.0
Total	16	689,808	2.3	1.3	3.8	2.9
Standardized Incidence Ratio = 0.63 (95% Confidence Interval 0.4 - 1.0)						

FEMALES						
Age	Number of cases	No. of person-years	Navy rate	95% Confidence limits ⁽¹⁾		U.S. SEER rate ⁽²⁾
				Lower	Upper	
0-4	7	196,666	3.6	1.4	7.3	5.3
5-9	1	199,470	0.5	0.0	2.8	2.7
10-14	0	156,809	0.0	0.0	1.9	1.5
15-19	0	86,498	0.0	0.0	3.5	0.9
20-24	2	25,660	7.8	0.9	28.1	0.6
Total	10	665,103	1.5	0.7	2.8	2.2
Standardized Incidence Ratio = 0.52 (95% Confidence Interval 0.3 - 1.0)						

(1) Confidence limits were calculated using the Poisson distribution. Source: Lilienfeld AM, Lilienfeld DE. Foundations of Epidemiology, 2nd ed. New York:Oxford, 1980:337.

(2) Rates are for 1994-1998. Source: Reis LAG, Kosary CL, Hankey BF, Miller BA, Clegg LX, Edwards BK, Eds. SEER Cancer Statistics Review 1973-1996, National Cancer Institute.

RESULTS

A total of 26 cases of lymphoid leukemia were identified in children of active-duty Navy families during 1997-2000, including 16 boys or young men and 10 girls or young women (Table 1). The first hospitalization rate for male children was 2.3 per 100,000 person-years. This compares with a mean incidence rate in the S.E.E.R. population for males 0-24 years old of 2.9 per 100,000 population. The Standardized Incidence Ratio (S.I.R.) was 0.63 (95% Confidence Interval, 0.4-1.0). The first hospitalization rate for female

children was 1.5 per 100,000 person-years. This compares with a mean incidence rate in the S.E.E.R. population for females 0-24 years old of 2.2 per 100,000 population. The Standardized Incidence Ratio (S.I.R.) was 0.52 (95% Confidence Interval, 0.3-1.0).

CONCLUSIONS

First hospitalization rates for lymphoid leukemia in children of active-duty Navy families were not significantly different from those of children in the general United States population.

REFERENCES

1. Garland CF, Ryan M, Gorham ED, Gunderson EK, Honner W, Miller M, Smith T, Garland FC. Report of Case Finding for Lymphoid and Myeloid Leukemia Among Navy and Marine Corps Members Assigned to NSAWC/ NAS Fallon or their Dependents. Naval Health Research Center Technical Document No. 01-3C. San Diego: Naval Health Research Center, 2001.
2. Reis LAG, Kosary CL, Hankey BF, Miller BA, Clegg LX, Edwards BK, Eds. SEER Cancer Statistic Review 1973-1996. National Cancer Institute Publication No. 99-2789. Bethesda MD: NCI, 1999:263.
3. Lilienfeld AM, Lilienfeld DE. Foundations of epidemiology, 2nd ed. New York: Oxford, 1980.

REPORT DOCUMENTATION PAGE

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14. ABSTRACT (maximum 200 words)

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